

# THE LIONS OF ASIA

BY

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(With 5 plates and a Map.)

## INTRODUCTION.

It is not my intention in this article to enter into particulars regarding the former distribution of the lion in Europe or Asia or to enumerate all the localities in Mesopotamia, Persia and India whence it has been recorded, because an admirable summary of this subject was published ten years ago by N. B. Kinnear (*Journ. Bom. Nat. Hist. Soc.* 1920, pp. 33-39), and I have very little to add to what he said.

My object is to settle, as far as the tolerably copious literature and deplorably scanty material at my disposal permit, the characters and status of the lion, or lions, of these countries and to discuss the scientific names that have been given to them. And for the sake of convenience I divide the main portion of this article into two sections, the first dealing with the lion of Persia and Mesopotamia, and the second with the lion of India. But there are one or two points of general interest that may be suitably dealt with first.

## LIONS, TIGERS AND PANTHERS.

In two recently published papers on Tigers and Asiatic Panthers (*Journ. Bombay Nat. Hist. Soc.*, vol. xxxiii, pp. 505-41, 1929; and vol. xxxiv, pp. 67-82 and 307-36, 1930), I gave my reasons for associating these two species with the lion in the genus *Panthera* and for severing them from *Felis*, and also my reasons for repudiating the view that the distinguishing characters of these great Cats are sufficiently important to justify their ascription to three distinct genera—*Tigris* for the tiger, *Panthera* for the panther, and *Leo* for the lion—a view recently revived in accordance with the superficial modern method of adopting generic titles without attempt at definition.

In the paper on tigers it was also shown that several of the characters usually accepted as infallibly distinguishing the skulls of tigers and lions, notably the length of the nasal bones, break down when large numbers of skulls are examined. Nevertheless, by the combination of a number of characters, the skulls of these two species can always, I believe, be distinguished at a glance by those accustomed to handling them. The lion's skull is typically lower and flatter than the tiger's, has shorter nasal bones, larger anterior nares and a shorter 'waist', i.e., the distance between the parieto-frontal suture and the postorbital processes on the summit of the cranium is less than in a tiger's skull of the same absolute length.

This last difference makes the facial portion of a lion's skull look longer and more massive as compared with the cranial portion. Also in a lion's skull the inner lobe of the upper carnassial tooth is not so well developed. But this lobe is liable to wear down with use and the character seems to fail in oldish tigers. The difficulty of laying down absolute differences arises from the great individual and racial variations in the size, shape, and other characters of tiger's skulls. Lions' skulls, both individually and racially, are less variable. Perhaps the one distinctive feature which holds good is the shape of the lower edge of the mandible. In the lion's skull this is slightly convex in front of the posterior angle, whereas in the tiger's skull the corresponding area is slightly concave. Hence the lion's skull 'rocks' and the tiger's skull rests steady on a flat surface. True, the extent to which a lion's skull 'rocks' is subject to variation; but I have never handled a tiger's skull capable of that movement.

It is well known that newly-born lion cubs are not uniformly tawny in hue like the adults; and it was stated by Lydekker (*Game Animals of India*, p. 293, 1924) that their spotted pattern proves the descent of the lion from a spotted progenitor, like the panther. Unfortunately for this theory, lion cubs are by no means always spotted. Many illustrations in the older natural histories show very definite transverse stripes on the cubs; and several years ago (*Ann. Mag. Nat. Hist.* (7), XX, pp. 436-45, 1907), when discussing this question. I described and figured a lion cub with a very distinct pattern of looped stripes and large rosettes tending to run into lines, a pattern more tigrine than pantherine. If we take this cub as a criterion, it appears to supply evidence that the ancestor of the lion in the matter of pattern stood midway between the panther and jaguar on the one hand and the tiger on the other; and this pattern is strong corroborative testimony of the close kinship between lions, tigers and panthers.

There is one other little point about lion cubs which may here be referred to. It is commonly said, and the statement was repeated by Blanford in his volume on *The Mammals of British India*, that they are born with the eyes open. Sometimes they are; but by no means always, as I know from my experience in the Zoological Gardens, London.

#### THE MANES OF LIONS.

Very naturally the manes of lions have attracted the notice of sportsmen and naturalists more than any other feature. But although a great deal has been written on the subject, it cannot be claimed that we understand the factors which determine the growth of the mane and the development of black pigment in it in individual lions. Some facts of interest, however, refuting the ideas formerly entertained, that 'black-maned' and 'tawny-maned' lions, and maned and maneless lions are racially distinct types are well-established.

It is well known that the mane is a secondary sexual character typically, but not always acquired gradually by males as they approach maturity. As is usual in such characters, its development

is prevented by castration (Jardine, *Nat. Library, Felinæ*, p. 120 (note), 1834) and it may be present in females as was shown by Brig.-Genl. R. Pigot who shot a lioness with a small mane in Kenya Colony in 1922 and exhibited its skin before the Zoological Society (*Proc. Zool. Soc.*, 1923). This case is analogous to the growth of small beards in old women and to the appearance of male characters in female game birds and waterfowl in which the ovary atrophies from age or injury.

*Maneless and small-maned lions.*—Lions which fail to develop any mane may occur in districts where these animals are typically maned. For instance, Patterson's man-eaters of Tsavo were maneless, although the lions of British East Africa carry, as a rule, tolerably good manes; and, as stated later in this paper, maneless lions have been recorded from Bussorah or Basra, although Mesopotamian lions are typically maned.

The lion of Gujerat was originally but erroneously called maneless. After commenting on this misapplication of the epithet by Smee and stating that these lions are smaller-maned than the African, Col. L. L. Fenton (*Jour. Bombay Nat. Hist. Soc.*, xix, p. 10, 1909), explained the circumstance by the home of the Gujerat or Gir lion 'being in a thorny jungle where its mane is bound to suffer, whereas the African lion is more or less a dweller in the plains.' General Rice (*Indian Game*) was, I believe, the founder of this fiction. In the first place, thorns would not pull out a lion's mane. The most they could do would be to comb out hairs on the point of being moulted or already moulted and entangled with the tightly adherent hairs of the mane. Deprivation of thorn-combing no doubt explains the frequently unkempt appearance of the manes of lions in captivity, owing to clumps or mats of shed hair clinging in places. I have never seen the manes of wild-killed lions with similar clogging of the hair. But the fallacy of General Rice's contention is further established by the existence of wholly maneless lions and by the occurrence of well-maned and maneless or almost maneless lions in the same district. Clearly the 'combing' theory will not explain this variation.

*Black-maned and tawny-maned lions.*—The terms 'black-maned' and 'tawny-maned' have been applied in a very loose sense to lions, but in such a way as to suggest that lions fall into one or the other of these categories. That is not the case. In my experience there is no such thing as a wholly 'black-maned' or a wholly 'tawny-maned' lion. Lions with the blackest manes always have the face surrounded by a tawny fringe. It is on the crest and the areas behind and below the head that the black pigment is developed giving a sharp contrast in colour between the mane and the body and fore legs. On the other hand lions with the tawniest manes almost always show a certain amount of dark pigmentation along the median crest and low down in front of the base of the foreleg. There is every gradation between these types; and 'black' and 'tawny' appear to imply merely a preponderance of one colour or the other in the mane. Furthermore, lions described as 'black-maned' and 'tawny-maned' may be found in the same place as has frequently been recorded.

From the available evidence, therefore, it appears that neither the luxuriance nor the colour of the mane can be regarded as of much importance in the differentiation of races of lions. But it may in the future be found when more extensive observations have been made that on the average the lions from one district may have heavier and blacker manes than those from another.

*The elbow-tuft and belly-fringe.*—These are also secondary sexual characters associated with the mane. The fringe along the belly is in reality composed of two crests of long hairs which, when well developed, extend from the chest in front almost to the groin behind where they may spread on to the lower part of the front of the thigh. This fringe is present in almost all the old pictures of lions taken from captive specimens; but it is generally absent or quite small in lions killed nowadays.

As a rule the size of the elbow-tuft corresponds to the size of the mane. In African lions this seems to be the case; but, as recorded below, it is not the case in the skins of the Asiatic lions I have seen.

*The tail-tuft.*—Unlike the mane, belly-fringe and elbow-tuft, the tail-tuft is not a secondary sexual character since it is found in the lioness as well as in the lion. It is independent of the factors which foster the growth of the mane and appears to be equally well developed in both sexes. Capt. Smee long ago pointed out that it is unusually large in the Indian lion.

#### THE EXTERMINATION OF ASIATIC LIONS.

It is a matter of common knowledge that within historic times the lion extended, so far as Europe and Asia are concerned, from northern Greece and Macedonia to western Bengal. In Europe, Asia Minor and Syria it has long been extinct. It may possibly still survive in parts of south Persia and Mesopotamia. At all events during, or just after, the Great War, Major Cheesman, writing to me from Iraq, reported that he and Sir Percy Cox had news of a lioness and cubs not far from their headquarters. They hoped to secure the cubs for the Zoological Gardens, but the project was never fulfilled.

Assuming that the lion is still a member of the Mesopotamian fauna, it is safe to prophesy that it will soon cease to be so. It is equally safe to state that by now it would have disappeared from India but for the enlightened views that led to its protection in the Gir Forest in Kathiawar.

It is reasonable to suppose that the factors which exterminated it in Europe, Asia Minor and Syria and have brought it to the verge of extinction in Mesopotamia and Persia, even if they have not already achieved that end, were the same as the factors which exterminated it over almost the whole of the area it occupied in India. In my opinion there is no reasonable doubt that the main, if not the sole, factor in the case of Europe and south western Asia was man. At all events it was most emphatically not the tiger. My insistence on this fact arises from an article published a few years ago in the *Field*, in which the author cited the practical



extermination of the lion in India by the tiger as an item of evidence of the physical superiority of the tiger entitling it to be regarded as the King of Beasts, instead of the lion.

Little, however, can now be achieved by debating what the exterminating agency was. The fact remains that Asiatic lions are now almost things of the past and there is practically no material available to tell us what they were like as wild animals. In fact most of the information I can gather about Mesopotamian and Persian lions is supplied by the observations of authors in the past upon captive specimens. This is an important point to remember.

#### THE EFFECTS OF CAPTIVITY ON LIONS.

In former years I had many a talk with F. C. Selous on the differences between wild lions and lions exhibited in menageries. He was firmly convinced that lions in captivity were darker in colour and grew larger manes than lions in their native haunts; and he saw in the Zoological Gardens full grown lions, caught as cubs near the Sebakwe River, Rhodesia, which he declared to be far more imposing in appearance than any he had himself shot in the same district.

This conviction of Selous', which was published in more than one of his writings, was subsequently confirmed by Hollister (*Proc. U. S. Nat. Mus.* 53, pp. 177-93, 1917), who stated that some young Masai lions after being transported to Washington got noticeably darker the longer they lived and that all of them finally were deeper in tint and more fully maned than the skins of Masai lions shot in the wild. He also showed that owing to the comparative disuse of certain muscles of the neck and jaws, the skulls of these captive lions differed profoundly in many respects from the skulls of the wild specimens. But he by no means exhausted the category of modifications the conditions of captivity impose on lions' skulls. I have seen skulls of menagerie lions differing from typical skulls of wild lions in many more particulars and even more markedly than Hollister recorded; but these skulls were for the most part taken from lions which had been born and reared to maturity in captivity and had thus been subjected all their lives to conditions adverse to the formation of good bone and to the development of the muscles of the head, the continued use of which by the wild animal affects considerably the shape of the skull.<sup>1</sup>

What has been proved to be true of some lions is probably true of all. Hence it follows that the colour of a lion that has been a few years in captivity will be darker than that of a wild one from the same locality and that if he is mature or old he will have a more luxuriant, and, in some cases at least, a darker, mane, and also a differently shaped head. These facts have an important bearing on

<sup>1</sup> Hollister's opinion, which obviously does not explain all the variations even in the skulls he examined was later challenged by Mr. A. Brazier Howell who thought that the deviations from the normal exhibited by the skulls of menagerie-reared lions were 'hardly influenced by the partial suppression of muscular stimuli, but were due to absence from the diet of some vitamin prohibiting rickets' (*Jour. Manum.* 6, pp. 163-68, 1925). In my opinion both factors are concerned in altering the shape of the skull.

the classification of lions because several races of African lions have been named on the evidence of captive specimens, and I shall have to revert to the changes above pointed out in considering the characters and nomenclature of the lions dealt with in this paper.

#### THE PERSIAN LION.

The Persian lion was first nominally and racially distinguished under the name *Felis leo persicus* in 1826 by J. N. von Meyer (*Dissert. inaug. anat.-med.* Vienna. *De genere Felium*, p. 6), who described it very briefly as being without the mane on the belly found in the Barbary lion and as paler than the Senegal lion. The discovery of this rare paper we owe to Hollister (*Proc. Biol. Soc. Wash.*, xxiii, p. 123, 1910), and further particulars regarding it to J. A. Allen (*Bull. Amer. Mus. Nat. Hist.*, 47, p. 222 (footnote), 1924). Von Meyer, however, cited no previous record of the animal and there is nothing to show the source of his information about it. He mentioned no special locality in Persia where it occurs.

In the following year Temminck (*Mon. Mamm.*, p. 86, 1827), published a very much fuller account, based upon a pair of specimens from Teheran he saw living at the time in the Exeter, Change in London. He called it 'Le Lion de Perse' and described it as remarkable for its very pale isabelline colour, with the mane composed of hairs of more varied tints than in lions from Barbary and Senegal, the great locks of black and dark brown hairs contrasting strongly with the pallid hue of the body, and added that there were no long hairs on the belly or legs. The male measured from 7 to 8 or more feet, including the tail which was 2 ft. 7 ins. or 2 ft. 9 ins. long. The vagueness of these dimensions is evidently due to guess-work owing to the impossibility of running a tape-measure over the living animal. The lion was evidently exceptionally small, if adult; but there is clearly no evidence that it was full-sized.

Temminck's description, above quoted, was the basis of the name *Felis leo persicus* proposed by Fischer (*Syn. Mamm.*, p. 197, 1829). Fischer, who was apparently ignorant of von Meyer's paper, described the animal as smaller than the Barbary and Senegal lions and very pale tawny (*pallidissime helvolus*), with a mane of moderate size, consisting of a mixture of black and dark grey hairs. This description appears to be nothing but a Latin version of Temminck's French description; and from Fischer's introduction of the word 'minor', it appears that he assumed the specimens Temminck saw were adult. There is no evidence that Fischer was personally acquainted with the Persian lion.

The only other name applied, so far as I am aware, to a lion from south-western Asia, was *asiaticus* given to one by Jardine (Jardine's *Nat. Library*, II, *Felinæ*, p. 121, pl. III, 1834). Jardine was unaware of, or ignored, the name *persicus*; and in his Synopsis, p. 265 of the same volume, he used the name *asiaticus* comprehensively for Asiatic lions, both Persian and Indian, having heard of Capt. Smee's description of what was unfortunately called the Maneless Lion of Gujerat. But the name *asiaticus*, on the available evidence, must

be affixed to the Mesopotamian lion, because, to illustrate the characters of *asiaticus*, Jardine published a drawing by Lear of a full-grown male, then living in the Surrey Zoological Gardens which had been brought as one of a pair of cubs from Bussorah (Basra) and presented to King George IV and were exhibited at first in Exeter, Change before being moved to the Surrey menagerie. He also printed some notes on this animal supplied by Mr. Warwick of the Surrey Zoological Gardens, and his statement that Temminck 'calls this the Lion of Persia' shows that he regarded his animal and the ones described by Temminck as specifically or racially identical. My own opinion is that the animals described by Temminck and Jardine were probably the same individuals. Since Jardine's specimen was presented as a cub to King George IV, it must have been received before June 1830, the date of that King's death, and it may very well have been still living in 1833 when Jardine was writing his book. The apparent discrepancy between the alleged localities can be easily explained. Temminck stated that the examples he saw came from Teheran. When Warwick told Jardine that they came from Bussorah, he was probably citing the port of shipment. Again, the size that Temminck assigned to the lion he saw in 1827 forcibly suggests that it was immature. The animal figured by Lear in 1833 and named *asiaticus* by Jardine was fully adult and, judging from the figure, had a full mane and a fringe of hair all along the belly, thus differing from Temminck's description. But the differences may be reasonably attributed to age and a few more years of captivity fostering the growth of the mane. This suggestion that Temminck and Jardine described the same specimen under different names has an important bearing upon the views of Matschie regarding the lions of Persia, as recorded below.

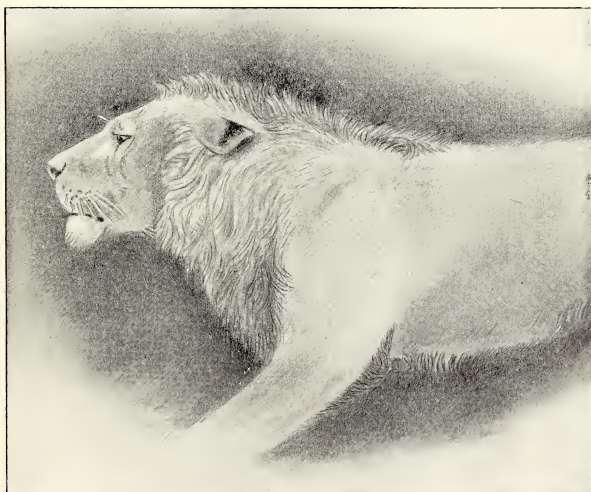
Lear's coloured figure represents a lion with a full mane covering the shoulders and tawny in hue round the face but turning blackish towards the shoulders and breast and blackish on the belly. The tail has a large tuft and the general hue is decidedly a paler yellower tawny than in a Barbary lion figured on Pl. II of the same volume.

Fitzinger, the next author to be mentioned in this connection, thought there were two kinds of lions in Persia (*Sitz. Akad. Wiss. Wien*, I, pp. 362-63, 1868). For the first he adopted the name *persicus* Fischer and quoted Temminck's description of the Teheran specimens; but knowing also Jardine's figure of the specimen alleged to have come from Bussorah, the specimen which was named *asiaticus*, and considering this animal to be specifically identical with the one Temminck described, he cited *asiaticus* as a synonym of *persicus* and modified Temminck's description by stating that the abdomen is maned and that the elbow carries a tuft. Although he remarked that no measurements were available, he described this Persian lion as the smallest known, thus apparently assuming that the examples Temminck saw and described were full-grown.

According to Fitzinger this lion was found in Afghanistan, Persia, Mesopotamia, Turcomania, Syria, Anatolia, Thrace Macedonia and northern Greece. But he can have known nothing of



The Persian Lion in the Surrey Gardens described by Jardine as  
*Leo asiaticus*. Adapted from Lear's drawing.



Persian Lion. Drawn from a flat skin in the British Museum.





European specimens; and I do not know on what authority the statement that it occurred in Afghanistan rests. He characterized it as ranging in colour from very pale tawny to ashy and as having a moderate mane of mixed dark grey and black hairs which extended along the belly.

To the second Persian species, or race, he admitted, he gave the name *guzeratensis*, an emendation of the name *goojeratensis* given by Smee to the Gujerat lion. Its distribution he stated was from India along the shores of the Persian Gulf to Mesopotamia and Arabia. It seems singular that he should have known so little of zoology as to suppose that two distinct species of lion occurred in South Persia and Mesopotamia. Nevertheless he distinguished this lion from the other Persian form by its darker tint ranging from tawny to pale reddish, its small uniformly coloured mane passing as a median crest over the withers but not along the belly. But this diagnosis is clearly taken direct from Smee's figure and description of specimens from Gujerat.

Matschie (*SB. Ges. Nat. Fr. Berlin*, 1900, p. 94) also admitted two races of Persian and Mesopotamian lions. For the first, named *persicus* Fischer, from Teheran, he adopted the descriptions previously published by Temminck and Fischer. His account of the animal as very small (*sehr klein*) shows that, like Fitzinger, he regarded the examples seen by Temminck as mature.

For the second race, inhabiting the Lower Euphrates, Babylon and Bussorah, he took the name *asiaticus* Jardine, thus differing from Fitzinger in thinking this lion was distinct from the Teheran lion. He distinguished *asiaticus* from *persicus* by being larger, darker coloured and carrying a heavier mane which extended along the belly. But it seems evident that Matschie's conception of this southern Mesopotamian race was derived mainly from Jardine's description and illustration of the Bussorah specimens exhibited in the Surrey Gardens in 1834 and from a statement (*Zool. Gart.*, iii, p. 97, 1862) that a Babylonian lion living at that date in the London Zoological Gardens had in proportion to its age a finer mane than one from Cape Colony in the same menagerie.

But Matschie's conclusion regarding the racial distinctness of these Persian lions, based on the data cited, clearly falls to the ground, if my opinion that Temminck and Jardine described the same individual lion is true, for that lion was the type specimen alike of *persicus* Fischer and of *asiaticus* Jardine. Moreover, the characters by which Matschie distinguished *asiaticus*, the greater size, the larger mane and the darker colour are precisely the characters one would expect to be acquired by an individual passing from youth to comparative old age under conditions of captivity. Assuming the lion to have been three or four years old when Temminck described it in 1827, it must have been nine or ten years old when Jardine named it in 1833. And since it is known to have been reared from a cub in the Exeter, Change and exhibited later in the Surrey Gardens, its luxuriant mane depicted by Lear as entirely covering the shoulders and extending as a long fringe down the breast and belly may confidently be assigned to its long period of captivity.

The same may probably be said of the mane of the Babylonian lion referred to by Matschie as mentioned in 1862. For this lion was one of a pair presented as a cub to the London Zoological Gardens in 1856. It was therefore fully adult in 1862.

Hence these two fine-maned specimens reared in captivity do not justify the conclusion that Mesopotamian lions produce big manes under natural conditions. They may do so at times, but I am not aware of any evidence in favour of that view. On the other hand, according to Olivier's testimony they may be maneless. This traveller stated (*Voyage dans l'Empire Othoman*, iv, p. 392, 1807) that in the menagerie of the Pasha of Baghdad he saw three maneless lions and two lionesses which had been captured five years previously at Bussorah. They were therefore mature. Apart from being maneless and smaller in size, they did not differ, he said, from African lions; and by further inquiries he elicited the information that the lions of that district were without manes. Sir Percy Sykes also referred to maneless lions as occurring in his time between Bushire and Shiraz. But possibly both Olivier and Sykes used the word 'maneless' in a comparative, not actual, sense as Smee did in 1833 when he described the Maneless Lion of Gujerat.

I am only acquainted with one record suggesting the possibility of the former existence of two races of lions in the Perso-Mesopotamian area. This was made by Layard (*Nineveh and Babylon*), who stated that he saw one, killed in Ram Hormuz, which was unusually large and of a very dark brown colour, in some parts of its body almost approaching black. He also described one killed in Khuzistan as 'unusually large with a short black mane.' But it is evident that both these specimens attracted his attention by their departure from the normal type of lions, with which he was well acquainted, inhabiting the areas he mentioned. His description of the example from Ram Hormuz indicates a lion much darker than any recorded before or since his time, so dark indeed as to make one think it might be regarded almost as a melanistic mutant, an interesting case, if so, because although tigers are sometimes black and leopards and jaguars not uncommonly, no black lion, so far as I am aware, has ever been seen.

Layard's record, however, need not further concern us since the lion is now no doubt extinct in that district and no zoologist would conclude on the evidence that this dark lion was racially distinct from the normally paler Persian type and name it accordingly.

The only Persian lion with which I am acquainted is a flat skin in the Natural History Museum received in 1847 and ticketed 'Persia. Warwick'. Since Warwick was associated with the Surrey Zoological Gardens, it is possible that the animal was exhibited in that institution. But there is no proof of this. At all events the skin was certainly not taken from the specimen, described by Jardine as *asiaticus*, if Lear's figure of that animal is to be trusted, unless it entirely changed the character of its mane in subsequent years, an eventuality which need not be entertained. Nor does the skin show either in its colour or in the luxuriance of its mane the effects that captivity has been known to bring about in some African lions.

Judging from its size, the skin, measuring, as recorded below, 9 feet 2 inches in length, was that of an adult, or nearly adult, animal, which, if a menagerie specimen, must presumably have been in captivity at least three years, since imported living lions are practically always taken as cubs when they can be handled without difficulty. Nevertheless the general colour is a pale tawny grey, paler or less richly tinted than most African lions owing to the black ticking of the hairs being less conspicuous or their pallid portion less ochreous or buff. The possibility of this paleness being due to exposure to light if the skin was used as a rug before reaching the Museum, where it has been kept in store, must be borne in mind. But the tint of the skin, as it stands, might, in my opinion, be truthfully described as 'very pale isabella', the words Temminck applied to the Persian lion from Teheran.

The lower surface and the inside of the limbs are whitish but the white is nowhere sharply contrasted with the pigmented surfaces, the two blending imperceptibly. On the paws the hairs between the digits, on the claw-sheaths and round the digital pads below are brown.

The mane is not full and is nowhere black but all along the crest from the forehead to the withers and low down on the lower throat, in front of the base of the fore legs and on the chest between them it is greyish brown owing to the hairs being a mixture of black, grey and tawny. All round the face and on the sides of the neck back to the shoulders it is pale tawny, paler than the body owing to the absence of black specking on the hairs. Behind and above the ears the hairs are quite short and there is no mane on the sides of the forehead between the front end of the crest and the tuft in front of the ears. The shoulders are quite naked except along the middle line between the shoulder blades where the hairs are from 3 to 4 inches long. On the cheeks and sides of the neck they are about 3 inches, and reach about  $4\frac{1}{2}$  inches low down towards the base of the fore leg. For the sake of comparison I may add that the corresponding hairs in a full-maned Rhodesian lion, a picked specimen, are much longer, in some cases nearly twice as long. On the other hand there is a tolerably large, thick brown tuft on the elbow the hairs being 2 inches long. This tuft is larger than in the skins of most wild-killed African lions I have seen. There is no mane along the belly, only a few long pale hairs, which would be unnoticed in the living animal, far back towards the groin, but there is a very conspicuous fringe on the breast. The tail tuft is better developed than in the African skins above referred to.

Although neither the colour nor the length of the mane in this lion can be regarded as of systematic importance, the combination of a small short mane with a thick conspicuous elbow tuft and a long fringe on the breast does not occur in any African skins I have seen. In these, so far as my experience goes, the development of the elbow tuft corresponds with the development of the mane.

But the most noticeable difference between this skin and those of African lions known to me lies in the hair on the body which is quite perceptibly thicker and longer.



## THE INDIAN LION.

The earliest account of an Indian lion with which I am acquainted was published by Griffith (*Vertebrated Animals. Carnivora*, p. 96, 1821) who wrote :—‘ A lion was lately exhibited at Calcutta which was brought from the interior, but which was not much larger than a mastiff, of a mouse-colour with scarcely any mane.’ Mouse-colour is a little vague, but it probably meant reddish or brownish. No doubt the animal was an immature male, darker in tint than the adult.

The Indian lion was first nominally distinguished as a variety, *bengalensis*,<sup>1</sup> by Bennett (*The Tower Menagerie*, p. 1, 1829), who gave the name to an adult pair exhibited in the Tower of London. But since Bennett’s account and illustrations have been apparently overlooked by all authors, except Blyth, it may be explained that these lions were captured as cubs early in 1823 by General Watson who succeeded in rearing them and getting them safely transported to England as a present to the King, who commanded them to be placed in the Tower.

Bennett described the illustration of the lion, drawn by William Harvey when the animal was in its prime at six years old, as a ‘ striking likeness.’

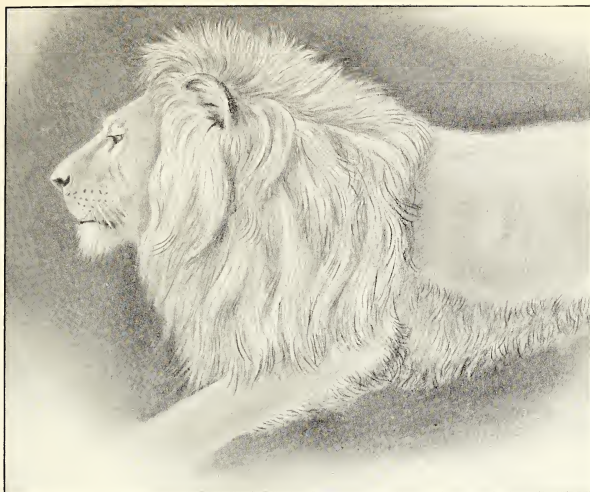
A point to be noticed about the sketch is the exceptional size of the mane which consisted of long, thick, hanging locks surrounding the face, covering the neck and the entire shoulders and extending all along the belly as a luxuriant fringe which in front invaded the flanks behind the lower part of the shoulder. It must have been the appearance of this lion that inspired Bennett to describe the Asiatic lion as carrying a mane ‘ in general fuller and more complete ’ than that of the African ; and he wrote of its belly-fringe as a ‘ peculiar appendage.’ On the annexed plate I give a sketch, adapted from Harvey’s woodcut, to show the size of the mane in this lion.

Although this lion, which, according to Blyth (*Cat. Mamm. As. Soc.*, p. 53, 1863), was found in Hurriana, not in Bengal as Bennett thought, acquired its mane during its six years’ life in captivity, it would be unwise to assume definitely that its growth was wholly the result of those conditions. It may have been an inherited character. Blanford, at all events, as recorded below, described two lions with very fine manes, one shot between Allahabad and Jubbulpoor and the other at Kota in Rajpootana ; and since in the case of the lions of Africa there is evidence that the finest maned specimens occurred at the Cape and in Algeria, the coldest districts they inhabit on that continent, it may be that lions of Hurriana, where the winter cold is tolerably severe, were naturally heavily maned.

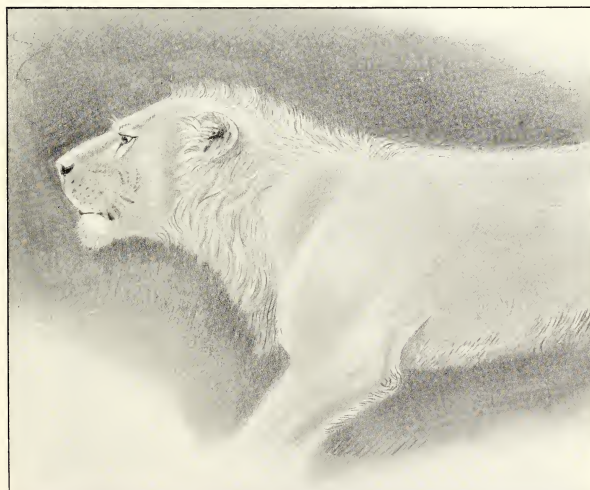
Bennett also stated that the Asiatic lion ‘ seldom attains a size equal to that of the South African ’ and that ‘ its colour is a more

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<sup>1</sup> This name is inadmissible for the Indian lion, having been previously applied by Kerr in 1792 to the well-known small leopard cat of India, *Felis bengalensis*.



Hurriana Lion in the Tower Menagerie described by Bennett as  
*Felis leo bengalensis*. Adapted from the original woodcut.



Gujerat Lion. Drawn from Capt. Smee's skin in the British Museum.



uniform and paler yellow throughout.' His use of the word 'throughout' suggests that the huge mane of the lion he described was for the most part at all events the same hue as the body, that the animal was in other words a 'tawny-maned', not a 'black-maned' lion. This agrees with the prevalent conception that Indian lions are mostly of the 'tawny-maned' type, although there is evidence of the existence in the country of partially 'black-maned' lions, as stated later on in this paper.

Four years after Bennett described and named the captive Bengal lion, Capt. F. Smee, without knowing Bennett's work, gave the name *gojratensis* to the lion of Gujerat (*Proc. Zool. Soc.*, Dec. 1833, p. 149), and followed this preliminary description with a fuller account illustrated by a coloured plate (*Trans. Zool. Soc. I*, p. 165, pl. 24, 1834). Unfortunately he adopted for his papers the trivial title 'The Maneless Lion of Gujerat'. But although he carefully explained that 'maneless' was only employed in a comparative sense to indicate, as he quite justifiably supposed on the evidence available at the time, that this lion could be distinguished from African lions by its smaller mane, the epithet was applied to the Gujerat lion over and over again by subsequent writers.

Smee's description of the animal was, nevertheless, quite good. The colour, he said, was fulvous (tawny) varying in intensity, being much paler in some specimens than others and palest in the oldest, and in dark specimens exhibiting a tinge of red and more black owing to the greater proportion of black hairs in the coat. The under surface, he added, was much paler than the upper, almost white. He also stated that the tail became gradually paler, passing into greyish white towards its extremity which carried an enormous black tuft, a very noticeable feature in Smee's illustration which was drawn by Lear.

The mane was tawny and poorly developed. It was short on the crown and nape, extended backwards as a low crest over the withers and was represented on the sides of the neck and throat by comparatively short hairs, the shoulders being entirely naked. Judging from the figure, the elbow-tuft was well developed and formed the upper end of a thick fringe of longish hair extending up the back of the fore leg. A very similar fringe extended along the belly and spread up the front of the thigh, the back of which was also fringed. The fringes on the belly and the front of the thigh were not, however, sharply differentiated from the flanks as in short-coated African lions that grow them, but blended imperceptibly with the hairs of the flanks which, it may be inferred, were tolerably long.

The largest lion obtained by Smee measured 8 ft. 9½ ins. in the flesh and was perhaps not quite full sized; but it gave the astonishing weight of 4½ cwts. (504 lbs.) without the viscera, which suggests a weight not far short of 550 lbs. with them. Selous once told me that the largest African lion he shot was 512 lbs.

The value of Smee's account of this lion lies in its being based upon a series of eleven specimens shot in the wild.

It is needless to repeat what the authors above quoted under the heading of the Persian lion wrote about the Indian lion, since



they epitomized Smee's description without apparently being personally acquainted with the animal. Matschie, however, on evidence which is not forthcoming, supplemented Smee's account by stating that the Gujerat lion is very large (*sehr gross*), thus differentiating it from the Teheran lion (*persicus*) which he had previously recorded as very small (*sehr klein*). But, as has been explained, his conception of the Teheran lion was apparently derived from Temminck's description of a pair of young animals. Certainly neither Smee's account nor any record, so far as I am aware, published before or since supports the view that the Gujerat lion is, as Matschie also added, the largest of all the races of lion, except the Cape race.

One other name for the Indian lion must be recorded, namely, *indicus*, given to it by Blainville in 1843 when he inscribed under the figure of the skull of an Indian lioness the title *Felis leo indicus* (*Osteogr. Mamm. Atlas. Felis*, Pl. VI).

Blanford in 1867 (*Journ. As. Soc. Bengal*, XXXVI, pp. 189-91) in a paper dealing mainly with records of the occurrence of lions in various parts of northern India, contributed some useful particulars about a couple of lions.

A male shot near the railway between Allahabad and Jubbulpoor had a luxuriant mane, with the longest hairs 11 inches in length and the colour sandy yellow, except along the crest and across the shoulders where it was blackish. The stretched skin measured: head and body 6 ft. 10 ins., tail 2 ft. 10 ins., total 9 ft. 8 ins. Blanford's guess that the animal in the flesh was a little under 9 ft. was probably approximately correct; but equally likely it was a little more.

Of another shot near Kota in Rajpootana, of which he saw a coloured drawing by a competent artist, he said, 'The mane was very fine and well developed, although the beast was killed in the hot weather', when the mane might be expected to be smaller than in the cold weather.

Unfortunately Blanford supplied no information about the general colour, or texture of the coat, or about the belly-fringe, elbow-tuft or tail-tuft. But the record of the length of the mane in the specimen first mentioned is of great interest because the mane of this animal was several inches longer than the mane of the finest wild-killed African lion in the British Museum.

In *The Mammals of British India*, pp. 56-58, 1888, Blanford, who was professedly not dealing with local races and took merely a superficial interest in them, added nothing to our knowledge of the characters of Indian as opposed to African lions. He does not even state whether the measurements he cited of a lion and lioness and the dimensions of the skull of a lion, were taken from Indian or African specimens. I am, however, certain that he was mistaken in saying that a lion measuring only 8 ft. 9½ ins. in total length was 3 ft. 6 ins. high. The standing height of such a lion would have been about 3 ft. at the most.

Of later writers who have added to our knowledge of the Gujerat, or, as he called it, the Gir lion, the late Col. Fenton is the chief. (*Journ., Bomb. Hist. Soc.* XIX, p. 10, 1909). Unfortunately he said

nothing about the colour or consistency of the coat but wrote at some length upon the development and tint of the mane and upon the animal's size. After repudiating the epithet 'maneless', he proceeded to ascribe the smallness of its mane as compared with African lions to its living in thorny scrub, accepting without demur the hypothesis that the mane is small from combing. I have already dealt with this suggestion and need not repeat what I said to refute it. He then quotes evidence for the occurrence of what he calls 'black-maned' lions in the Gir forest; but admits they are extremely rare. It does not seem that he actually saw or shot one himself. Nor is it clear what he meant by 'black-maned' in the matter of intensification and extension of the pigment. But to illustrate a second paper he wrote on hunting the Gir lion (*Journ., Bomb. Nat. Hist. Soc.* XX, 1910), the editor of that journal inserted a photographic plate (facing p. 737) of a full-grown lion in captivity at Junagadh. This animal, so far as it is possible to judge, had a mane at least as full and black as the best-maned East African lions; and making all allowances for the probable effects of captivity upon the length of the mane and for the possible effect upon its pigmentation, this lion attests the potentiality for the development of a large, partially black mane in the Gir lion. It is noticeable, however, that the mane of this lion is not comparable in luxuriance to that of the Bengal specimen, described by Bennett, which was six years in captivity in London, and it has no fringe along the belly.

With regard to the size of the Gir lion, Col. Fenton maintains that it is probably as large, on the average, as African lions. The largest he shot was 9 ft. 5 ins. Two others, a little younger, were respectively 9 ft. 1 in. and 9 ft. Thus the smallest was a little longer than the largest obtained by Smee; but the largest was smaller than one obtained by Lord Harris which was 9 ft. 7 ins. A comparison of these dimensions with those of lions from East and South Africa mentioned in Rowland Ward's *Records* suggests considerable superiority in the average size of the African specimens, which range from 9 ft. 8 ins. to 10 ft. 7 ins., the average of 30 examples being 10 ft. But, as Col. Fenton remarked, these examples were probably specially selected for measurement on account of their supposedly large size. At all events, out of a large number of adult males shot in British East Africa and the Eastern Belgian Congo for the American Museums and measured in the flesh by trained collectors the average length is only a little over 9 ft. Col. Fenton's contention, therefore, that the Gir lion is on the average as large as African lions seems well founded.

The only specimens of the Gujerat lion in the British Museum<sup>1</sup>

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<sup>1</sup> Seeing that there is not a single complete wild-killed example of this lion in the national collection it is galling to know that an English sportsman, Col. Faunthorpe, was permitted last year to shoot a couple of lions and a lioness in the Gir Forest for the American Museum of Natural History, New York. An account of this trip was written by Mr. A. S. Vernay, who accompanied Col. Faunthorpe, and published with photographs in *Journ., Amer. Mus. Nat. Hist.* Jan., 1930, pp. 81-89, and in *Country Life*, March 8, 1930. Mr. Vernay

are the tanned skin of a subadult male shot by Capt. Smee, the skin and skull of an adult female that was reared and exhibited in the Zoological Gardens, and the dried skin of a half-grown lioness. But thanks to the kind offices of Mr. Wilfred Osgood the authorities of the Field Museum of Natural History, Chicago, have most generously sent to me on loan the perfect skin and skull of a nearly adult male which was shot by Col. Faunthorpe. I am also greatly indebted to the Natural History Society of Bombay for sending to me for examination the skins of two specimens from the Gir Forest.

The characters of these skins are as follows :—

(1) Capt. Smee's specimen. The coat is thick and long, a little longer than in the Persian skin above described, and lacks the sleekness and smoothness of the coat of most African lions, being long enough to be brushed in any direction.

Since this skin was for several years exhibited in the public gallery as a mounted specimen it is probably a little faded. Nevertheless it is a rich dark tint describable as rich ochraceous tawny, richer and darker than the Persian lion, with the black ticking of the hairs more in evidence. The colour of the flanks gradually blends with the buffy or cream white hue of the under side, and the same may be said of the outer and inner surfaces of the limbs; the toes are whitish with black and white hairs between them and black hairs on the claw-sheaths and round the pads; up the back of the fore leg the hair gradually increases in length to expand into the elbow-tuft the hairs of which are about  $2\frac{1}{4}$  ins. long; a slightly darkened mat extends up to the hock on the hind leg. The tail becomes grey towards the end and the hairs beneath towards the tip are long, becoming longer where they pass into the black tuft, the greater part of which is missing.

The mane is small and scanty, much smaller than in the Persian specimen, being restricted to the nape, the fore part of the sides of the neck, the cheeks and throat. It is mostly tawny but brownish grey along the crest on the nape and low down in front of the base of the fore leg. On the withers the crest gradually blends with the adjacent hairs of the spine and on the head it is disconnected from the tuft in front of the ears and the hairs round the ears are short. The crest on the withers is about 2 inches long, on the nape nearly 3 inches, on the forehead in front  $1\frac{1}{2}$  inches, and low down on the cheek and throat the hairs are from  $3\frac{1}{2}$  to 4 inches.

On the posterior half of the belly on each side some longer hairs, nearly 3 ins. long, constitute an incipient belly-fringe everywhere blending with the longish hairs adjacent to it.

The measurements of the skin are: head and body 5 ft. 11 ins., tail (imperfect) 2 ft. 7 ins., total, allowing for the loss of 1 in. from the tail, 8 ft. 7 ins. Since the skin was stuffed and subsequently tanned it may be stretched. In any case it cannot be assumed to have been taken from the largest of Smee's specimens, presumably

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mentions the shooting of only two specimens, an old lion and a lioness. But Col. Faunthorpe secured a third, the subadult male described in this paper which belongs to the Chicago Museum and was kindly lent to me,

the one he figured, which measured in the flesh 8 ft. 9 ins. It is nevertheless a co-type of *Felis leo goojratensis*.

When the specimen was unstuffed it was found to contain a tiger's skull. Smee had two skulls but their whereabouts is unknown.

(2) Col. Faunthorpe's specimen in the Chicago Museum. This skin differs considerably from Capt. Smee's both in the texture of its coat and in colour. The coat is a trifle shorter but is smoother and obviously not so thick and loose. The body colour is much lighter everywhere, the pelage instead of consisting of rich ochraceous buff hairs with black tips is a mixture of clear whitish grey and pale isabelline hairs with black ticking, the general result being a buffish grey lion, silvery grey in certain lights, darker with a brownish tinge in others; the head, cheeks, outer sides of the limbs and the tail are also everywhere paler and greyer, although the hairs round the pads and on the toes are jet black. Also the chin, throat, inside of the fore leg and of the hind leg below the hock are cleaner white and the belly is whiter and less buff. When the two skins are placed side by side, Col. Faunthorpe's looks grey and Capt. Smee's brown.

There is very little to choose between them in mane-growth; but in Col. Faunthorpe's skin the mane is on the whole paler, being very much the tint of the body except on the cheeks where it is a richer golden buff with silky white reflections. The small elbow-tuft is a mixture of dusky grey and white hairs about  $2\frac{1}{2}$  ins. long. The tail-tuft is black, thick, with hairs about  $2\frac{1}{2}$  ins. long.

The skin measures: head and body 6 ft. 2 ins., tail 2 ft. 9 ins., total 8 ft. 11 ins. It is thus a little larger than Capt. Smee's. It may be stretched to a slight extent but not much, I think, since it was very skilfully stripped for mounting and was obviously never pegged out. But the skull shows clearly that the animal was not quite full-sized.

Although judging from their size, there is no great discrepancy between these two lions in the matter of age, the differences between them in the colour and texture of the pelage may be attributable to that factor. Or it may be a question of season. Col. Faunthorpe, as stated by Mr. Vernay, shot his lions in February 1929. But no date can be assigned to Smee's specimen.

(3) Of the two skins received from Bombay one is that of an adult or nearly adult male presented to the Natural History Society by the Maharajah Kumar Sahib of Kotah. It is unfortunately undated because the coat differs from that of the two skins already described in being short, rather coarse and lustreless, apparently dead hair ready for shedding. The general tint of the upper side is pale, a sandy grey, much paler and greyer than Smee's skin, but more sandy and less silvery grey than Faunthorpe's. It differs from both, especially from Faunthorpe's, in the complete absence of white from the under side and inside of the limbs. These areas, including even the chin, are washed with pale buff blending everywhere with the tint of the upper side.

The mane is tolerably thick but not so long or so shaggy as in the other skins and differently coloured. Except on the median crest and along the posterior border where there is a slight mixture



of black imparting a brownish tinge, it is everywhere a rich rather golden tawny, lacking the greyish tint of Smee's skin, and is more sharply defined by its richer colour from the paler tint of the body. The elbow-tuft is distinct but small and mostly pale; there is no trace of the belly-fringe, and the tail-tuft in conformity with the general shortness of the coat is small as in most African lions, not large as in the longer coated skins collected by Smee and Faunthorpe.

This skin has been merely cured, not dressed and stretched, and is certainly dried and shrunken. It measures: head and body approximately 5 ft. 5 ins., tail 2 ft. 6 ins., total 7 ft. 11 ins. It is difficult to estimate the extent to which it is shrivelled but the animal would probably have been at least another 12 ins. in total length.

(4) The second specimen received from Bombay is the skin of a young male. The coat is long and a dark greyish tawny in hue, darker than the last, owing mainly to the conspicuousness of the black tips to the hairs, but it is not so dark or richly coloured as Smee's skin, there being much less ochraceous tawny in the hair. The chin and throat and most of the inner side of the fore leg are tinged with buff; but the belly and inside of the hind leg are white. Spots are evident below, pale tan on the belly, brownish on the hind legs, paler and smaller but traceable to the paws on the fore leg. The mane is undeveloped but there is a conspicuous black crest on the nape formed by the confluence of the black tips of the convergent streams of hair. The elbow-tuft is small but traceable; but most of the middle of the tail-tuft is missing. This skin measures: head and body 4 ft. 10 ins., tail 2 ft. 2 ins., total 7 ft.

I have described these four skins at some length because of the lack of detailed information about the variation in colour of the Indian lion.

The following points are interesting:—

(1) The immature skin, although darker than two of the others, is not so dark or richly coloured as the third, namely, Capt. Smee's skin.

(2) The general shortness, scantiness and lifeless aspect of the hair of the skin that belonged to the Maharajah of Kotah, especially when compared with the thick, long, luxuriant coat of Capt. Smee's specimen, forcibly suggest considerable seasonal change in the colour and texture of the pelage.

(3) The Maharajah of Kotah's sandy grey skin is also interesting on account of the pale buff tint of the whole of the light parts.

(4) Precisely similar variations in the length of the coat and the colour of the upper and under sides, exhibited by these three skins, have been used by American zoologists as a pretext for dividing the lions of Central East Africa into four named local races or sub-species.

(5) The Persian skin, above described, is not exactly like any one of the three Gujerat skins, but does not differ more from them than they differ from each other. It is darker and more ochraceous tawny than the Maharajah of Kotah's skin, coming nearly midway between it and Smee's richly coloured skin.





Gujerat Lion presented to the Zoological Society, London, by H. H. the Maharajah Sahib of Navanagar.

The only other Gujerat lion I have seen is one presented to the Zoological Society in 1921 by H. H. the Maharajah Jam Saheb of Nawanagar. It was a full grown animal, rather pale tawny or sandy in tint; but it had been in captivity for many years and had developed a good shaggy mane, as shown in the photograph of its head here published (Pl. III). A noticeable feature about this lion is the length and thickness of the hair along the back of the fore leg up to the elbow-tuft, and the fringe on the fore part of the chest below; also the extension of the mane as a very distinct fringe behind the shoulder, this being a common feature in lions kept many years in captivity. The coat is generally longish.

(6) The tanned skin, with skull, of the adult lioness from Gujerat which died in the Zoological Gardens on February 21, 1857<sup>1</sup> and was presented by the Society in that year, is very handsome, with an exceptionally long and thick coat, longer everywhere, allowing for the absence of mane, than in Capt. Smee's lion, being as much as 3 ins. on the breast, belly and elbows. The tail-tuft also is large, the hairs measuring up to  $3\frac{1}{2}$  ins. in length and considerably exceeding those of wild-killed African lions. The colour is a rich almost ruddy tawny, a little richer and darker in tint and more heavily speckled with black than Capt. Smee's lion above described. It agrees very well with Smee's description of the darker Gujerat specimens which were said to be reddish in hue. The light parts also are rather better coloured than in Smee's lion. It may be that the dark hue and long coat of this lioness are due to several years of captive life. But if Smee's specimen is a little faded from exposure as a mounted specimen, there was not much difference between the two. The skin measures: head and body 5 ft. 4 ins., tail 2 ft. 8 ins., total 8 ft.

(7) The skin of a young lion from Junagadh, Kathiawar, which was exhibited at the Colonial Exhibition of 1886 and was presented by H. H. the Nawab Sahib. The colour of this skin is quite unusual. It is a dark rufous-brown tawny all over, even on the under side and the inner surfaces of the limbs. There are spots on the legs, stronger on the hind than on the front. The animal was probably about a year old since the flat skin measures; head and body 3 ft. 8 ins., tail 1 ft.  $8\frac{1}{2}$  ins., total 5 ft.  $4\frac{1}{2}$  ins.

There can, I think, be no doubt that the dark reddish tint of this skin, pervading as it does the usually whitish or buffy white lower parts and also the inner hairless surface of the hide, is due to staining from some preparation with which the skin was dressed.

<sup>1</sup> Although this skin is merely labelled 'Asiatic lion', there is, in my opinion, no doubt that it belonged to the female of a pair from Gujerat presented to the Zoological Society by the Rajah of Jahnuggar through Sir Erskine Perry and Capt. Jacob in January 1854. According to the Society's records there were in the later fifties of the last century two pairs of Asiatic lions in Regent's Park, namely, the pair above referred to and a pair from Mesopotamia presented in 1856. This pair was entered in the books as 'young'; and since the skin and skull under notice are those of an animal fully mature early in 1857, she cannot have been the female of the Mesopotamian pair. Since, moreover, the Museum of the Zoological Society was disposed of in 1854, this lioness clearly did not form part of the old collection,



The following table shows the lengths of some Indian lions, taken in the flesh or derived from skins :—

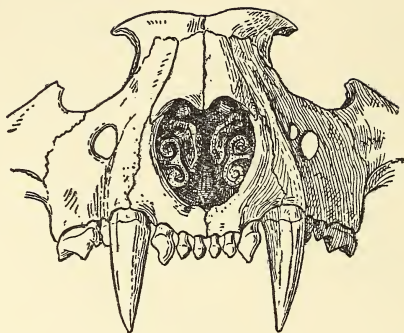
Locality and Sex	Total length	Head and Body	Tail	Remarks
	ft. in.	ft. in.	ft. in.	
Gir Forest ♂ ...	10 2	7 6	2 8	Stripped skin (Lord Lamington).
Allahabad ♂ ...	9 8	6 10	2 10	„ „ (Estimated length about 9 ft.).
Gir Forest ♂ ...	9 7	...	...	In the flesh (Lord Harris).
„ „ ♂ ...	9 5	6 6	2 11	„ „ (Col. Fenton).
„ „ ♂ ...	9 3	6 6	2 7	„ „ (Count F. Scheibler, ex Rowland Ward).
„ „ ♂ ...	9 1	...	...	„ „ (Col. Fenton.)
„ „ ♂ ...	9 1	...	...	„ „ (A. S. Vernay. An old lion).
„ „ ♂ ...	9 0	...	...	„ „ (Col. Fenton).
„ „ ♂ ...	8 11	6 2	2 9	Dressed. (Col. Faunthorpe in Chicago Museum).
Ahmedabad ♂ ...	8 9½	...	...	In the flesh (Capt. Smee's largest).
„ ♂ ...	8 6	5 11	2 7	Dressed. Tail imperfect (Capt. Smee in Brit. Mus.).
Gujerat ♀ ...	8 0	5 4	2 8	„ (Zool. Soc. in Brit. Mus.).

It may be added that Col. Fenton ascertained that the dimensions of Lord Lamington's specimen were taken from the stripped skin. He therefore rejected them as exaggerated. According to Blanford the skin from Allahabad was also stretched. Eliminating the dressed or stripped skins and Capt. Smee's largest specimen, which was very doubtfully mature, and taking the specimens from the Gir Forest which were measured in the flesh, we find that the average total length of these six is slightly under 9 ft. 3 ins., which is about the same as the average of East African lions.

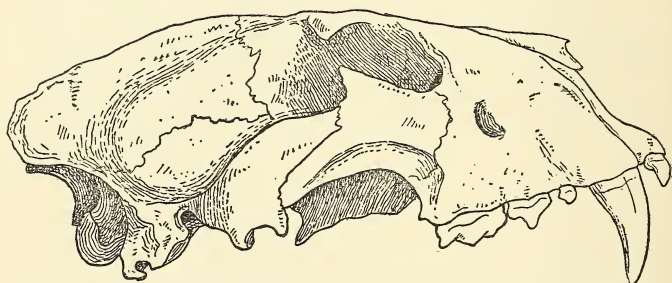
#### THE SKULLS OF INDIAN LIONS.

In a note on the skulls of lions and tigers contributed to Capt. Smee's paper on the Gujerat lion, Prof. Owen described in the skulls of two Indian lions, preserved in the Museum of the Royal College of Surgeons, a peculiarity he failed to find in the skulls of African lions. This was the duplication of the infra-orbital foramen, at the anterior root of the zygomatic arch, by a bridge of bone dividing it into an upper smaller and a lower larger portion.





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FIG. A (1) Facial portion of skull of lioness from Amreli showing duplication of the infraorbital orifice on the left side.

FIG. A (2) Lateral view of skull of adult male lion from Amreli.

In one of the skulls from 'Assund in N.W. Hindustan', presented by Col. Finch in 1830, this peculiarity was present only on the left side, the foramen on the right side being large, reniform and normally entire. In the other specimen from North Gujerat, received in 1822, the orifice was more widely bridged on both sides but not quite symmetrically, the bridge on the right side being wider than on the left and showing a third small hole. Capt. Smee recorded similar division of the foramen in the two skulls he possessed. Great, therefore, was my interest to find this foramen divided on both sides in Col. Faunthorpe's lion skull belonging to the Chicago Museum. In this skull the arrangement is very nearly symmetrical, the bridges being narrower than in the skull from North Gujerat, so that the lower orifices are larger, thus resembling the condition seen in the foramen of the left side in the skull from Assund. (Plate IV, Figs. A 1 & 2)

Nevertheless in three skulls that have recently come into my hands, the modification is present on one side only in two of them; on the right side in a young lion and on the left side in a young lioness. It is absent in an adult lion. It is also absent in the skull of the lioness received from the Zoological Society. It cannot, therefore, be regarded as an absolute distinction between Indian and African lions, although, on the available evidence, it occurs in most of the former, but never occurs in the latter. It presumably originated as a fortuitous variation. No use can be claimed for it, yet from the records given above we know that it has been inherited for over a century and how much longer it is impossible to say.

On inspecting the two skulls, referred to as lions by Owen, in the Museum of the College of Surgeons where they were kindly submitted to me by Mr. R. H. Burne, F.R.S., I was disappointed to find they are skulls of lionesses, although one of them is entered in Flower's Catalogue of the collection as a lion's. Both, however, are adult, although the one from Assund is considerably the older of the two. (Plate V, Figs. B 1 & 2)

The three skulls above referred to as recently received were kindly presented to the national collection by the Maharaja of Bhavnagar when he learnt from Lt.-Col. A. H. E. Mosse, I.A., on information received from me, that the British Museum possessed no skull of a wild-killed Indian lion. The animals themselves, an old male and sub-adult male and female, were shot some twenty years ago, by the late Maharaja in the Amreli District of Kathiawar on the eastern border of the Gir Forest. The skins were made into rugs with the skulls mounted in them and preserved in the Maharajah's Palace; but the skins proved to be worn and useless and only the skulls were worth preserving. I am greatly indebted to Col. Mosse for securing these valuable specimens for the Natural History Museum and for the opportunity thus afforded of recording their characters in this paper. The skull of the adult male is perfect apart from the loss of a few teeth; but the loss of the occipital bone in the others prevents me recording their lengths and observing the shape of the auditory bullæ.

The following table gives the principal dimensions of the skulls